

Wildlife Management Plan

City of Hampton

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The Mission of the Wildlife Management Plan

The City of Hampton hereby assumes responsibility for the stewardship of the city's wildlife by developing a wildlife management plan in 2006 whose goal is to conserve the city's wildlife and habitats and to promote the maintenance of biological diversity while accommodating human needs. (See Appendix A for complete outline of the mission statement, goals, objectives, and strategies).

The History and Significance of the Plan

The city recognizes that natural communities, including all native plants and animals, have their own inherent value and provide invaluable ecosystem services to the human community. Therefore, the goal of the wildlife management plan is to reduce negative interactions between humans and wildlife while providing as much as possible for the welfare of the natural communities, understanding that such providence serves human needs as well. Fulfilling this mission is dependent upon the integration of the information needed to guide sound management, approval by the Hampton City Council and the citizens of Hampton.

Historically, there has been no wildlife management plan to guide the City of Hampton through wildlife-human interactions. Recently, concern has arisen that certain species of wildlife have become a nuisance and require management. In particular, the deer population in the Harris Creek section has exceeded the cultural carrying capacity of this community. Deer have caused significant property damage and have otherwise become a serious annoyance to citizens. As a result, on 12-10-97, the Hampton City Council amended and re-enacted Section 40-18 of the city code that prohibited hunting and the discharge of certain weapons within the city limits. This code allows citizens to apply for hunting permits, under strict limitations, to harvest deer within city limits. On the same date, city council deemed it necessary to develop a wildlife management plan in order to enhance the conditions of wildlife and human interactions. Due to this action, a committee comprised of city and state agencies, including private and service-oriented organizations, was created to produce a comprehensive wildlife management plan. This plan represents a general description of the planning committee's intentions regarding the stewardship of the city's wildlife and habitats.

Human-wildlife interactions have increasingly become an issue in modern urban sprawl. Humans are encroaching on once pristine wild areas that have been home to various forms of wildlife. As humans expand their domain, wildlife is destroyed (directly or indirectly), displaced, or adapts to the changed environment. Cities are beginning to recognize that many wildlife take the latter option, particularly species that are ecological generalists or benefit from cohabitation with humans. Such species are often regarded as pests by humans. The fact that the numbers of white-tailed deer in the United States have rebounded from fewer than 500,000 in 1920 to over 14 million today indicates the seriousness of the current situation (Landau and Stump 1994). The primary goal of this plan is to deal with this issue. The most significant threat to wildlife in our area is habitat loss and degradation through encroachment and pollution. While the numbers of individuals in pest species such as deer are rising, the number of species worldwide is decreasing. The current rate of extinction is, in fact, higher than at any time in Earth's history, even the period during which the dinosaurs became extinct (Wilson 1992). The high rate of extinction and the increase in numbers of individuals of pest species both result from urbanization. There is only so much room on the planet, and human activities are currently selecting for the pest species at the expense of other species. Fortunately, management that controls pest species tends to foster biodiversity. Cooperative efforts that produce dynamic, long-range programs are needed for successful management of these problems.

Hampton's Ecosystems

One of the most predominant habitats in the City of Hampton consists of wetland areas. Since wetland areas are federally protected, these areas are being managed primarily as wildlife habitat. It would make sense that we should concentrate on enhancing these habitats, as they are alternative areas in which wildlife can retreat as other areas are developed. A prime example of this is Sandy Bottom Nature Park. As surrounding areas are being developed as housing projects, retail centers and roadways, the diversity and quantity of wildlife in the wetland areas of the park is increasing. This presents a potential problem for the park if not addressed in a timely manner. A separate resource management plan for the park has been developed which targets problems that are unique to the ecosystems and management objectives that are specific to the park environment. Similarly, a resource management plan for Grandview Nature Preserve has been developed

cooperatively between the city and the Virginia Department of Conservation and Recreation, Division of Natural Heritage. This plan will be expanded to encompass many issues dealing with the Hampton's waterfront, and specifically, threatened and endangered species at Grandview Beach. A similar plan is in the beginning stages for Grundland Creek Park. Since many of the city's open spaces are city parks, management plans will be adopted for each park with site specific recommendations.

Wildlife corridors are another concern in developing areas (See Appendix B). Studies indicate that when development divides large land areas in which wildlife ordinarily live and migrate, some species are deprived of the open spaces that they need to survive. Many animals, including small songbird populations, have large home range requirements. This is acreage that is needed to ensure that a population is large enough for maintenance of a healthy gene pool (Landau and Stump 1994). Ecosystem conservation involves conserving, enhancing, and restoring the native biological diversity (plants and animals) and ecological integrity of natural systems. This proactive approach does not have to be restricted to large scale projects on state and national parks. An ecosystem focus applied at all scales from large public open spaces to individual properties in residential subdivisions will emphasize a consistent educational message. The best way to conserve our natural biological diversity is to maintain and restore natural functions of ecosystems. Although maintaining full natural ecosystem function is not possible in most urban landscapes, more realistic and measurable objectives such as maintaining a percentage of the native plant and animal diversity or increasing the diversity by a specific number a year on a specific site can be easily accomplished (Schaefer 1997).

Grey and Deneke 1992 in *Urban Forestry, Benefits of the Urban Forest*, p.108 state:

Wildlife exists as a byproduct of vegetation, and thus the manipulation of vegetation for the above purposes (see Appendix C) affects the diversity and composition of wildlife populations. Wildlife, especially songbirds, adds color, movement, and sounds to the landscape, and thus can contribute much to the human habitability of cities. Basic to the management of desired urban wildlife species is our understanding of their habitat requirements. Such knowledge could be used to manipulate vegetation to provide the amenities of wildlife in addition to those of the vegetation alone.

Note: Appendix C contains examples of wildlife friendly architectural uses for vegetation in urban settings.

People, Wildlife, and Recreation

People have an abiding love for wildlife and the natural world. Wilson (1992) feels that humans feel very strong but subconscious connections with the natural world. He notes that humans prefer to live near water and parks. Plants and animals are frequent images and symbols in human arts and religion. Children do not find comfort in hugging stuffed houses and cars; they find comfort in hugging stuffed animals. Wilson terms this love of nature “biophilia.” Economists even recognize the importance of the existence of the natural world to people. It has been determined that people simply want to know the natural world is there, whether or not they directly partake of it or its resources. The value people place on the existence of nature is termed the “existence value” of nature by economists, and methods have developed for calculating this value (Meffe & Carroll 1997).

The results of a recent United States Fish and Wildlife survey indicate that the general population is concerned with the welfare of our wildlife and that people enjoy a wide range of activities that revolve around wildlife. Of the responses, 93 million participate in some form of wildlife activity that does not result in the removal of animals from their natural habitats. Of these, an estimated 72 million Americans took a special interest in observing, identifying, photographing, or feeding wildlife. This is compared with 14 million who hunt and 33 million who fish. The study found that most of this wildlife-oriented activity took place in residential areas. Significantly, 23 million people participated in wildlife observation and other wildlife friendly activities within a mile of their homes. Those who took trips primarily for wildlife activities totaled 34 million. Many states, along with the federal government, have initiated “Watchable Wildlife” programs (Landau and Stump 1994). Amount spent on trips, equipment, and other wildlife items totaled 54.9 billion. With the rich natural resources available in the City of Hampton, it only makes sense that we would establish a similar municipal program here. Grandview Nature Preserve Sandy Bottom Nature Park and the new canoeing and walking trail at Newmarket Creek provide excellent arenas for this program. The groundwork has been set with nature program on wildlife being offered at these locations through the park ranger program.

Protecting Our Natural Resources - Laws

Certain natural resource laws may be applicable to ecosystems within the City of Hampton. Among them are the Virginia Natural Area Preserves Act (*Code of Virginia* sections 10.1-209-217) (Appendix D), the Federal Endangered Species Act (16 USC 1531-1544), the Virginia Endangered Species Act (*Code of Virginia* sections 29.1-230-237), the Virginia Endangered Plant and Insect Species Act (*Code of Virginia* sections 3.1-1020-1030), the Federal Clean Water Act (33 USC section 1344), the Virginia Wetlands Act (*Code of Virginia* section 28.2-1300-1320), the Virginia Coastal Primary Sand Dune Act (*Code of Virginia* sections 28.2-1400-1420), the Chesapeake Bay Preservation Act (*Code of Virginia* sections 10.2100-2115), the Virginia Submerged Lands Law (*Code of Virginia* section 28.2-1200-1213), the Virginia Environmental Quality Act (*Code of Virginia* sections 10.1-1200-1221), the Open-space Land Act (*Code of Virginia* section 10.1-1700 through 10.1-1705), the National Environmental Policy Act (42 USC sections 4321-4307d), (Adele 1998) the Migratory Bird Treaty Act (16 USCS 703-712), Virginia Hunting, Fishing and Trapping Laws, Rabies Control (*Hampton Code*, Chapter 5, Article VI, Article I In General, Sec. 5-3), and other applicable codes to be researched.

The Virginia Natural Area Preserves Act contains the enabling legislation for the Virginia Area Preserve System and the Natural Area Dedication. The Federal Endangered Species Act, the Virginia Endangered Species Act, and the Virginia Endangered Plant and Insect Species Act pertain to species that are listed or are proposed to be listed as threatened or endangered at the state or federal level, and provide protection measures for listed species. The Federal Clean Water Act, the Virginia Wetlands Act, the Virginia Coastal Primary Sand Dune Act, and the Virginia Submerged Lands Law pertain to protection of wetland communities and submerged areas within the city. The Virginia Chesapeake Bay Preservation Act requires local governments to pass ordinances designed to improve water quality through changes in land use practices, thereby improving the environment for humans and wildlife. The National Environmental Policy Act and the Virginia Environmental Quality Act require environmental review of certain projects proposed, funded, or authorized by state or federal agencies or institutions (Erdle 1998). This would be applicable to many of the city's environmental grants, such as the Virginia Recreational Trails Grant at Sandy Bottom Nature Park. The Migratory Bird Treaty Act provides for protection of

migratory bird species. Virginia Hunting, Fishing, and Trapping Laws govern these activities throughout the state and are enforced primarily by the Virginia Department of Game and Inland Fisheries. Hampton's Rabies Control Code provides for guidelines in dealing with rabies in the city.

Perhaps the greatest impact to wildlife conservation is how the city guides the development of its land area. Section 15.2 of the Code of Virginia provides localities with the ability to provide for the orderly development of land including the identification of lands to be set aside for open space. The basic guiding document of the land use regulatory process is the Comprehensive Plan. It expresses the city's overall philosophy and policy toward its future physical development and specifies strategies for achieving that development. In addition, land that is to be acquired for public use such as a park or nature preserve must be identified in the plan in order for public funds to be expended for acquisition. The city also has a considerable amount of say over the development of private lands. The zoning ordinance is the primary land use regulatory tool that lists uses permitted in individual zoning districts and generally spells out the substantive restrictions on land use and development. This is accompanied by subdivision regulations which regulate the act of dividing land, most often for the purpose of permitting development, by dictating such things as the width of streets, lengths of cul-de-sacs and size of lots.

See appendix D for a list of Natural Resource Laws.

Plan Management and Cooperative Efforts

Provisions for incorporating wildlife considerations into the planning process for urban areas are based on generally accepted wildlife management principles and approaches. The choice for approaches is widely varied, however. These include the creation of refuges as the city has done with Grandview Nature Preserve, Sandy Bottom Nature Park, and Grundland Creek Park, predator control or enhancement, artificial stocking, transplanting of wild stock either into or out of an area, winter feeding, erection of nest structures, protection through regulation of hunting (or control through hunting), and habitat management. Of these habitats management is the most basic. It is on the habitat management that the urban planner, landscape architect, developer, and builder have the most impact. It is their designs that determine in large part how and where and to what extent existing habitat will be altered in the course of developing new

areas or redeveloping existing urban areas (Grey and Deneke 1992). Habitat management is certainly the least expensive alternative. A proactive approach in this area can result in the prevention of many problems later. When problems arise such as the overpopulation of deer in the Harris Creek area, more drastic approaches are necessary. This management plan is designed to help prevent these type of problems from reoccurring in other areas of the city in the future and to find viable solutions for those that already exist.

A list of agencies and individuals that have provided input into this plan may be found in the acknowledgements. Other agencies, such as the Virginia Marine Resource Commission, come into play as present and future granting agencies for conservation projects. A Management Team will be formed to monitor the project and will consist of representatives from many of the agencies that were consultants in the development of this plan. The Hampton City Council will review the recommended list of individuals and will have final approval in their appointment.

Key Terminology in Wildlife Management

Biological Diversity, or *Biodiversity*, refers to the diversity of life in all its forms and all its levels of organization, not just the diversity of plant, animal, and microorganism species. Biodiversity encompasses, at its lowest level, the organic molecules that are the genetic basis of life, to the vast stretches of desert, forest, tundra, ocean, etc. known as biomes. Somewhere in the middle lies community, species, family, culture, ecosystem, etc. The wildlife habitats within this system are our concern in the development of this document. It is imperative that we protect the biodiversity of our city in order to promote the concept that all life forms have some value. By managing for diversity we manage for all life forms (Hunter 1990).

Merriam Webster's Collegiate Dictionary, 10th Edition, lists *wildlife* as:

Living things and especially mammals, birds and fishes that are neither human nor domesticated

For the purposes of this document, this is an appropriate definition. It is not the intent of this plan to address domesticated animal concerns.

Wildlife is a word of recent origin, and although often associated with game birds and mammals, its meaning is gradually expanding. Hunter (1990) defines wildlife as all forms of life that are wild and thus includes all wild animals, plants, and microorganisms. Using a broad definition of wildlife avoids the use of phrases such as “destroying wildlife habitat” and “good for wildlife”, because, for example, forest practices that destroy habitat for one species will create good habitat for another. From this perspective, one of the most basic objectives of wildlife management is to maintain or restore all of a region’s native wildlife populations, with a particular emphasis on endangered species (Hunter 1990).

An *ecosystem* is all the interacting populations of plants, animals, and microorganisms occupying an area, plus their physical environment. The living organisms in an ecosystem are collectively called a *community* (Hunter 1990). The City of Hampton is an ecosystem that contains a wide variety of communities. Examples of these communities include; freshwater lakes, streams, marine, saltmarsh, forested wetlands, riparian edge, pond, meadow, forest, etc.

Disturbances (e.g., fire, storms, carefully-timed mowing or bush hogging, selective timber cutting or thinning) that alter the community and initiate new succession may increase the variability of the environment and thus decrease the likelihood that a few species will exert long-term dominance (Denslow 1985).

Habitat is defined in the Webster’s Third New International Dictionary as:

The place where a plant or animal species naturally lives and grows; the kind of site or region with respect to physical features (as soil, weather, elevation) naturally or normally preferred by a biological species.



Human/Wildlife Interaction - Deer

Addressing human/wildlife interactions is one of the key goals in the measurable success of this plan. One of the main concerns in the decision for development of this plan was the problem of deer browsing on property owners' gardens and shrubs. In an attempt to alleviate this problem, the Hampton City Council passed an ordinance allowing property owners who own five or more acres to apply for a permit to harvest deer on their property. At the time only two permits have been issued, no deer have been harvested under this new ordinance. Yet, the problem persists. The wildlife management planning committee had several proposals for helping to alleviate this problem. Following is a list of options that will be researched as to feasibility and available resources:

- Compile list of browse-resistant plants (deer) to distribute to homeowners in affected areas. (Sample list in Appendix E. Note: The plants on this list are browse-resistant, not browse-proof, and may not work 100% of the time.)
- Maintain a lethal control option by authorized agencies.
- Provide a list of public agencies that can give assistance with preventive behavior.
- Distribute written information to homeowners regarding responsible interaction with wildlife and possible deterrents. (Sample list in Appendix F).

White-tailed deer are browsers, feeding on shoots and leaves of woody plants, not grasses. This is unfortunate in that most homeowners would not mind a grass-mowing deer. The most active browse times are early morning, from dusk into evening, and moonlit nights. They like young plant

buds and shoots, leaves, succulent plants, shrubs, bark, berries, and other fruits. In areas where deer have overpopulated and are competing for food sources, a visible “browse line” will appear at the bottom of trees. When this source is expended they will begin stripping the bark from young trees. (Landau and Stump 1994). At this point, neighboring homeowners start becoming concerned. Deer begin losing their inhibitions about human contact when starvation approaches.

In the City of Hampton the area which has been experiencing the most problems with overpopulation is Area 5.

Human/Wildlife Interaction - Other Mammals

Raccoons – The main concern when one thinks of raccoons is rabies. This is a definite concern and is why people should avoid contact with animals in the wild, especially rabies vector species such as raccoons.

However, raccoons can cause other problems in urban areas. In Hampton, enemies to the raccoon include dogs, automobiles, and humans. If confronted, raccoons will often try a counter threat, fluffing their fur so as to appear large; they may utter a throaty growl or cry. Despite a bold appearance, they are usually not aggressive except during mating season or when defending their young. Their strength, teeth, and claws equip them to defend themselves effectively, so do not approach. (Landau and Stump 1994). During offspring season mother raccoons will emerge from their nest and venture out during the day to find food as their young get bigger and require more food. This could also occur during the extreme winter nights as food could be frozen.

Urban problems include raiding garbage cans, visits to yards or porches, taking up residence under the house or even inside the house, attic, or chimney, and raiding or digging up the garden. A simple solution is to put trash can out day of trash and store them in a shed type structure. If shed is unavailable, strap bungee cords across top.

Solving the problem of entering buildings is as simple as closing up possible entryways, making repairs, etc only once if there is young and they have left the den area. They can be discouraged from gardens by chemical deterrents available at most garden centers.

Opossums – Tolerance of this animal is encouraged. The primary message to homeowners who happen to see an opossum in their yard is not to worry. The animal will likely be moving on in a short time and will likely not be a concern or a threat. They, in fact, are beneficial as scavengers and consumers of undesirable invertebrates (HSUS 1997). They are also known to consume venomous snakes.

Moles – These creatures are common in the City of Hampton and are well known by most homeowners who try to maintain a lawn. Of course minimizing the size of the lawn is the most direct approach to controlling these animals.

Other wildlife friendly approaches include erecting barriers around flower or garden plots by burying hardware cloth in the form of an L-shaped footer (see figure 1) configuration. Concrete edges buried 8 to 12 inches underground, in addition to keeping weeds out of beds, may repel tunneling moles. These approaches are labor intensive and expensive and are recommended to homeowners only in exceptional situations. Repellents may also be used. Success has been reported by using garden pinwheels that transmit vibrations into the ground to frighten moles away from the yard. Commercial battery operated devices are available which also transmit vibrations (HSUS 1997).

Rabbits – Cottontail damage is usually the result of their feeding habits. Flowers and vegetables are eaten in the spring and summer and fruit trees and ornamentals in the fall and winter. Deterrents include commercial tree wraps to prevent bark damage by rabbits. Repellents are available in the form of Thiram-based repellents for use on inedible species of plants. Soap and hair are home remedies that are safe on edible varieties. Scare tactics can be used such as wind tape or balloons (HSUS 1997).

Bats – Local species of bats are insectivorous and are ecologically important because of this role. These animals are of concern mainly due to their roosting habits. Because of decline in habitat they tend to find shelter in walls and attics. The homeowner's best defense is to keep all possible entryways into the home closed and holes repaired. Homeowners may also consider installing bat houses in their yards as an alternate roosting site. Contact with bats is discouraged due to the potential risk of rabies. However, bats pose little threat to human, as they are very unlikely to attack under any circumstances. Contrary to popular myths, bats do not fly into people's hair. Bats pose little threat to humans, however, as they are very

unlikely to attack. Tolerance of bats is encouraged. Bats can consume up to 5,000 insects depending on the species.

Squirrels, Flying Squirrels, Chipmunks – The most common complaint about these animals is that they raid birdfeeders. However, squirrel-proof birdfeeders are available. Also, the addition of ground, dried hot peppers (commercially available) to birdseed discourages squirrels from consuming birdseed. All birds are insensitive and unreactive to the peppers and eat the treated seed as avidly as untreated seed. The regular feeding of squirrels is not recommended as these animals are at or above the carrying capacity of the environment. When squirrel densities are high, fighting occurs that results in potentially fatal injuries. Generally, local mast crops are adequate for these animals. Squirrels cache food for the winter by burying it.

Beavers – There are relatively few beavers in the city considering all of the waterways. A location of concern is along Newmarket Creek adjacent to Sandy Bottom Nature Park. Beavers continue to build dams in this location. The City of Newport News dredges and tears down the dam, along with its den each time it is built. A solution will be researched since the dam is partially on the City of Hampton side and in a nature preserve where they are supposed to be protected. A continued solution for the beavers at the golf course will be trapping and possible relocation to Sandy Bottom Nature Park lake area, away from Newmarket Creek.

Mice and Rats – Introduced species of mice and rats have displaced native species important to biodiversity and the functioning of natural ecosystems. The introduced species are a serious health threat due to the spread of filth and disease. These rodents continue to be a health concern, as they are in many urban areas. They are very adaptable to humans and even seem to thrive on human waste and garbage. This is why they are such a health threat by spreading filth and disease. The City of Hampton has an entomologist on staff who handles rodent problems. The health department indicates that his department does an excellent job in dealing with rodent problems.

Muskrats – These native animals can be beneficial to wetlands by maintaining areas of open water. This increases biodiversity by creating a mosaic of microhabitats. However, their populations are beyond the carrying capacity of the environment as they benefit from human modifications to the environment and the reduced number of predators. The

main area of concern in Hampton seems to be at the Woodlands Golf Course. Muskrats are being trapped for removal from areas in which they are causing burrowing damage.

Foxes – Both red and gray foxes occur in Hampton. The red foxes are not native and displace gray foxes. Red foxes were not found on the Lower Peninsula before 1947. Both species are carnivores but also consume plant materials; gray foxes eat more plant foods than do the red foxes. Gray foxes are capable of climbing trees, but the red foxes are not. Both species are known to live around humans, denning under sheds and porches, etc. Both will consume small pets and pet food left outside. Foxes are vectors of rabies and can become aggressive toward humans when rabid. Generally, these animals should neither be feared nor encouraged by feeding.

Coyotes – In 2006, coyotes was documented in Hampton on Langley Air Force Base and in the Grandview area in 2013 by Park Rangers. The State considers these animals to be nuisance exotics (nonnative) and so subject to extirpation. Their potential effect on local ecosystems is difficult to predict, but as top carnivores they could help control deer and fox populations. However, they will kill livestock such as sheep. They can also potentially interbreed with domestic dogs, producing coydogs; fertile hybrids that can be a serious nuisance, as they are pack hunters that are less afraid of people than coyotes.

Nutria- These large, exotic rodents are semiaquatic and ecologically similar to muskrats although they are much larger in size. They have caused serious environmental and agricultural damage throughout the southeastern United States. These animals may be invading the Newmarket Creek area. The State regards this species as a nuisance species subject to extirpation. Nothing should be done to promote this species in Hampton.

Bobcats- These animals were regarded as rare or nonexistent on the Peninsula by Terwilliger (1991) based on trapping data. It is unclear from Terwilliger whether their absence is natural or human-induced. However, numbers of these animals have been increasing in the State, and bobcats have been reported in Newport News. These animals are solitary top carnivores. They are usually quite shy and not a danger to humans except for the remote risk of transmitting rabies and their potential for consuming roaming small pets. It is unlikely that Hampton contains large enough tracts of wild areas for these animals, but their presence would be welcome.

However, future habitat management will not take bobcats into consideration.

Black bear- These very large omnivores are not listed by Linzey (1998) as being on the Peninsula at all. However, bears have been seen at the northern end of Newport News Park and possible bear damage was found along Big Bethel Reservoir recently. While there probably are not wild areas of sufficient size to sustain a viable population of black bear, it is highly likely that dispersing juveniles will end up in Hampton in future years. Virginia Department of Game and Inland Fisheries will manage such animals. These dispersing animals are usually not aggressive toward humans, but they are large and potentially dangerous if they feel threatened. Future habitat management will not take bears into consideration.

(See Appendix G for general list of animal and bird repellents.)

Human/Wildlife Interaction- Reptiles and Amphibians

Both reptiles and amphibians are considered to be indicator species; that is, they are indicators of environmental quality. This is especially true of amphibians because their skin and eggs are so permeable to solar radiation, gases, and chemicals in the environment. The decline in amphibians is so serious and widespread that it is known as the “Global Amphibian Decline.” The major factor in the decline of amphibians and reptiles locally is the loss of habitat, particularly wetlands. The fragmentation of large tracts of forests into small, unconnected tracts is also a major factor. These smaller tracts are often too small to support viable populations. Additionally, these smaller, isolated tracts are often separated by highways or human development and do not permit the reestablishment of populations extinguished by natural events such as drought (Meffe & Carroll 1997). Amphibians are particularly susceptible to poisoning by homeowners’ use of pesticides and herbicides. These chemicals leach out of lawns and into streams and ponds. Other documented factors in the declines of reptiles and amphibians are: pollution and poor water quality, diseases transmitted from bait fish or released pets, predation by introduced game fish, increased UV light levels due to the thinning of the ozone layer in the atmosphere, fungal disease from exotic fungi (apparently accidentally transmitted around the world by people), and decreases in precipitation due to natural or human-induced global warming.

Venomous snakes occur in low numbers in Hampton. The canebrake rattlesnake is the only well documented venomous species currently. There was a single sighting in 2004 of an Eastern Cottonmouth (*Agkistrodon piscivorus piscivorus*) at Sandy Bottom Nature Park. It is believed that this snake was released here due to this area not being its natural habitat. While this snake's bite can pose significant risk to humans, canebrakes are generally quite docile. Their primary defense is crypsis (camouflage), the avoidance of detection. They tend to remain coiled and very still when people come near. They generally rattle only when they feel very threatened. They will only strike when seriously molested; even then venom may not be injected. The venom is primarily for securing food, not defense. The best response on the part of people is to move slowly away from rattlesnakes. Snakes, including this rattlesnake, will not pursue people. No documented deaths from rattlesnakes have occurred in decades in Virginia. Nationally, most snakebite results from captive animals or while attempting to capture or kill a snake. Bites from wild animals that were not being molested by people are extremely rare. Local researchers have observed canebrakes in nature to simply hide their head when stepped on by hunting dogs. Should snakebite occur, modern snakebite treatment is highly effective. While a bitten person should go to the hospital promptly, and transport by ambulance with trained personnel is a good idea, snakebite by the canebrake (or the copperhead or cottonmouth) should not be viewed as an imminent risk to life. The main issue in treating snakebite is the prevention of shock, very low blood pressure that can lead to heart and organ failure.

When addressing human interaction with reptiles or amphibians tolerance is encouraged. In cases where threatened, endangered, or venomous species are concerned avoidance is recommended. There was a time when the only good snake was a dead snake. Times are changing however. Thanks to environmental education that negative attitude is almost a thing of the past. A 1988 survey revealed that less than half of the adults responding were afraid of snakes (Conant and Collins 1991). Many people realize that snakes are typically reluctant to "attack" people unless threatened or provoked. They are also beginning to understand the importance of snakes in their role as predators. Many snakes may adapt to urban settings and control pest populations. For example, the black rat snake (*Elaphe obsoleta*) feeds primarily on small mammals such as rats and mice. Due to the loss of suitable habitat snakes may seek shelter in basements, crawl spaces, or attics. To avoid such situations all possible entryways into homes should be

checked frequently to ensure they are closed.

Amphibians present no health or physical threats to humans. Therefore, tolerance is encouraged. Due to the loss of habitat, spring evenings once abundant with the sounds of calling frogs, are now silent. The global amphibian decline is a major concern warranting in-depth research and conservation efforts. The wildlife management team will investigate suitable conservation efforts for Hampton. Habitat conservation and enhancement should be implemented to maintain or form viable populations. Conservation of non-tidal wetlands, monitoring of water quality and compliance with pertinent natural resource laws are imperative. Encouraging landowners to develop suitable habitat, where appropriate, would also be useful.

The release of exotic reptile and amphibian pets into Hampton's ecosystems is a concern and is discouraged. The release of store bought turtles such as Red-eared sliders (*Chrysemys scripta elegans*) into local lakes and ponds has resulted in the hybridization of our native species and could ultimately result in the contamination of their gene pools. The biggest concern is the release of pets or relocation of wild animals such as snakes and turtles.

Certain species of reptiles and amphibians warrant special concern in the City of Hampton. They include the Canebrake Rattlesnake (*Crotalus horridus*) and Mabee's Salamander (*Ambystoma mabeei*). The Canebrake rattlesnake is listed by the Department of Conservation, Division of Natural Heritage as endangered in the state of Virginia. Mabee's salamander is listed as threatened in Virginia by the same agency. These are addressed in the endangered species section.

Human/Wildlife Interaction – Migratory Songbirds

Neotropical migratory songbirds are species that breed in North America during the spring and summer months and travel hundreds or thousands of miles south to spend the winter in the tropical and subtropical Americas. Common migrants through Virginia include Wood Thrush, Red-eyed Vireo, American Redstart, Black-throated Green Warbler, Ovenbird, and Scarlet Tanager. Migration is a hazardous journey for these birds. One half of the birds that leave their northern range in the fall will not make it back in the spring. Predation and starvation are the main two reasons. Many birds cannot find the necessary food to meet the high amount of energy needed to

make the flight. In eastern North America, many migrants fly south along the coast, called the Atlantic flyway. Migrants often fly these routes at night, all night long, and land to rest early in the morning. Before dawn they seek out suitable habitat in which to feed and avoid predators. This site is known as a stopover. Stopovers are very important since flights over barriers, i.e. mountains, deserts, or large bodies of water, will mean a long stretch with no opportunity for food, rest, or cover. Along the Atlantic flyway, two major barriers are the Delaware and the Chesapeake Bay. The southern end of the Eastern Shore and the lower peninsula (Hampton) are two main stopovers.

Concern for migratory songbirds goes beyond the aesthetic pleasures of bird watching. Their ecological functions add further incentive to protect them and their habitat. It is estimated that one pair of warblers will clear one million leaves of caterpillars to feed themselves and their young during nesting season, reducing the caterpillar population by as much as one-half. Swallows and Purple Martins feast on mosquitoes. Orioles and Tennessee Warblers are important plant pollinators in their southern wintering habitat. Other species of songbirds disperse seeds of various plants.

While migratory songbirds themselves are protected by legislation, their habitat continues to decline. With so much attention focused on the loss of tropical forests, many people do not realize that habitat loss and fragmentation in this country has recently far exceeded that of Central and South America. Fragmentation is the segmenting of forest tracts due to development, farming practices, etc. Fragmentation results in the loss of food sources that is so critical during migration. Birds are also forced to fly from patch to patch in search of food making them more susceptible to predators. Loss of food sources and increased vulnerability to predation and nest-parasitism are indirect, yet very significant, pressures brought upon migratory songbirds as a result of declining habitat.

Important in the conservation of migratory songbirds is the protection of forest and shrubland habitats in their summer and winter ranges as well as critical stopover sites. It is desirable to minimize the removal of trees and shrubs where development occurs. Individual landowners will be encouraged to initiate their own backyard habitat conservation program. (Reference Landowner Incentive section.) The Alliance for the Chesapeake Bay's Bayscapes program can provide interested landowners with information to make environmentally sound landscaping decisions.

Recently, more and more localities are learning how conservation of biodiversity can lead to economic benefits. In Northampton County, local citizens encourage tourism focused specifically on the area's ecological resources. The Eastern Shore of Virginia National Wildlife Refuge and Kiptopeke State Park conserve biodiversity and attract tourists. The Eastern Shore Birding Festival, held in Northampton County every year during the second weekend in October, draws nature enthusiasts from around the state and around the country to bird watch and experience fall migration. Events such as this benefit area businesses and provide examples of how conservation enhances rather than diminishes economic opportunity. A similar type of event will be researched for the Hampton area, possibly at Grandview Nature Preserve and/or Sandy Bottom Nature Park. A hotel would be utilized for educational sessions and exhibits, with buses providing birding and wildlife watching field trips to the natural areas. (Information on songbirds obtained from: *Natural Resources Fact Sheet, Migratory Songbird Habitat in Virginia's Coastal Plain*, Virginia Department of Conservation and Recreation.)

Human/Wildlife Interaction – Other Birds

Raptors – Hawks are probably the most familiar raptors. It is not unusual to see a red-tailed hawk perched in the trees along the roadside in Hampton. Forest edges are valuable habitats for hawks since they use this as a vantage point for spotting small rodents that run out from the treeline. This can be a disadvantage to the hawk on roadways. They are often hit by vehicles when going after prey that is in the median or that runs onto the road.

Bald eagles are being seen more frequently in the Hampton area. One nesting pair has taken up residence here since 1997. Hampton currently has 4 pair of nesting bald eagles. Bald eagles have been delisted from endangered to threatened in recent years because of their comeback with the hopes of being delisted from the listed species list. The location of these nests is not public knowledge in order to protect the birds from curiosity seekers. Excessive human presence may prompt the birds to relocate.

The osprey, or fish hawk, is often seen in Hampton. They are, however, being threatened by development along waterways. Human activities in those areas are encouraging predators, such as raccoons, which raid nests. Most harmful to the birds is human littering. Discarded plastic and other

trash that ospreys gather to line their nests can choke their young. (Landau and Stump 1994).

Other species of hawks and falcons frequent the Hampton area. Provision of habitat for this bird is essential to ensure their continued presence.

Passerines - Smaller species of birds known as passerines are generally known as songbirds. Habitat protection is the primary concern with these birds, as with most other species of desirable birds. Providing backyard habitat is very desirable for passerines, especially those that overwinter and need food and water sources.

Wild Turkeys - Wild turkeys are known to be in the Hampton area. From a once estimated population of 10 million birds in North America, as few as 300,000 were left by the early 1950's. Conservation efforts, altered land use, and reintroduction programs have helped to raise this figure considerably (Landau and Stump 1994). However, many areas that were abundant with wild turkeys have sparse populations due to development. Areas such as Sandy Bottom Nature Park encourage their repopulation.

Feral Turkeys – These birds are a crossbreed between wild and domesticated turkeys. Feral turkeys are more aggressive, larger, and have a tendency to destroy yards and personal property. One way to discourage these birds from entering citizen's yards are not to feed the turkeys. The numbers of feral turkeys has increased and are becoming a problem in the Fox Hill area. Removal of the birds as well as a long term solution is being discussed through a Turkey Committee.

Ducks and Geese – These birds can become aggressive in neighborhood parks due to humans feeding them. Many people make the mistake of feeding ducks and geese with their leftovers from the picnic. This tends to “spoil” the birds and causes them to harass park visitors for more of the same. Education on what to feed wild birds will help to alleviate this problem.

Gulls – When gulls remain along the shoreline, they are beneficial in cleaning dead fish and other marine life from the beach. However, the creation of landfills and other garbage collection sites, such as dumpsters, have caused a problem. Gulls tend to frequent these areas due to their scavenger nature. Flocks of gulls in neighborhoods and in parking lots tend to be undesirable due to droppings and the noise. Other shorebirds and

waders are desirable to most nature observers. Protection of our shoreline and wetland habitats will ensure their continued presence.

Monk Parakeets – These birds are feral (animals released into the environment after being raised in captivity, usually as pets or for agricultural or economic reasons). Agricultural damage is the main concern in other countries that have experienced these birds. Currently, their populations are increasing along the Atlantic coastal areas of the United States, particularly in Florida. In Virginia, it is illegal to transport them into the state unless moving here and only if the bird is close-banded.

Human/Wildlife Interaction – Protected Areas and Endangered Species

(See Appendix H for list and abbreviations for some of Hampton's species of concern.)

The most delicate and pristine environment in the City of Hampton can be found at Grandview Nature Preserve. The beachfront at Grandview stretches for 2 ½ miles and protects dune and marsh areas that are rich in plant and animal life. This area is the only location in the Chesapeake Bay that so closely resembles the barrier island area of the Eastern Shore. Barrier beaches are dynamic natural environments found between open waters of the Atlantic Ocean or the Chesapeake Bay and the marshes or uplands associated with the mainland. In addition to the sandy shore known as the beach, this community also includes the vegetated dune system and the sandy fan-shaped flats or “overwash fans” among or behind the dunes. Barrier beaches are harsh and highly energetic systems. Wind and water move sand on barrier beaches creating a constantly changing environment. The shore is so dynamic that virtually no rooted plants can grow there. Many species of small animals such as clams, crustaceans, and insects have adapted by burrowing into the sand. Some species of birds evolved special adaptations, such as long probing beaks, to forage for food on the shore. (Information on barrier beaches obtained from: *Natural Heritage Resources Fact Sheet, Barrier Beaches*, Virginia Department of Conservation and Recreation.)

With the City of Hampton being located so close to the Atlantic flyway, Grandview and many other areas of Hampton are ideal stopovers for migratory birds. Discussed here are some of the species of birds and other animals that are of concern at Grandview.

Rare Odonates: Dragonflies and damselflies together make up the insect order Odonata. The Greek word “odon” means tooth. It refers here to the toothed jaws of these predatory insects.

The Long-legged Green Darner, a dragonfly also known as the Comet Darner, the Southern Sprite, and the Seepage Dancer are a few of the state’s rare species that may be found at Grandview and in other areas of Hampton. The most significant threat to dragonflies and damselflies is loss or degradation of the aquatic habitat in which they lay their eggs and the nymphs spend most of their lives. Landowners will be encouraged to follow best management practices when performing any activity that would affect water levels or water quality of these habitats. (Information on rare odonates obtained from: *Natural Resources Fact Sheet, Rare Odonates Found in Virginia’s Coastal Plain*, Virginia Department of Conservation and Recreation.)

Northeastern Beach Tiger Beetle: The beach itself is home to the northeastern beach tiger beetle (*Cicindela dorsalis dorsalis*). This insect is currently designated as threatened by the United States Fish and Wildlife Service and has been recommended for the state and federal legal status of threatened due to its drastic decline in range and susceptibility to threats. Grandview Nature Preserve beach is of particular concern due to the fact that it is the southernmost point on the eastern seaboard where the beetle is found.

Tiger beetles are beautiful insects, and unlike most beetles, they are long-legged, fast moving, and agile. Adult northeastern beach tiger beetles are about 2/3 of an inch long. They have bronze-green heads with large pinching jaws and a white or cream colored back with paired dark markings. Two antennae protrude from the head. Like all insects, northeastern beach tiger beetles have a larval stage in their life cycle. The caterpillar- like larvae grow up to 5/8 inches long and have a large hump on their back. The heads of the larvae also have large jaws as in the adults. The larvae beetles make straight deep burrows, 4 to 10 inches deep, in the upper intertidal zone of the beach. This is the area in which they are most vulnerable.

Threats to the beetle include its own life cycle due to the fact that the beetle larvae usually require two years to complete development. The primary natural enemies are the wolf spider and a wingless parasitic wasp that stings

the beetle and lays its eggs in them. The most serious threat to the beetle is the tramping and loss of beach habitat from coastal development. The larvae are especially sensitive to disturbance from off-road vehicles and heavy pedestrian traffic on beaches. Because of their beauty and rarity, the species can also be threatened by collection. These human impacts along with natural factors such as winter storms, beach erosion, and natural enemies can result in elimination of local populations. Due to Hurricane Isabel on September 18, 2003 the numbers of adults dramatically decline and now are on the brink extinction at this sight. This conclusion came after the 2004 survey by Randolph-Macon College and U.S. Fish and Wildlife Service. [Information on the northeastern beach tiger beetle obtained from: *The Natural Heritage Resources Fact Sheet: Northeastern Beach Tiger Beetle (Cicindela dorsalis dorsalis)*, Virginia Department of Conservation and Recreation, Division of Natural Heritage.] In April 2011 the connection from Grandview Beach to Factory Point was completed. No adults were found until the 2012 surveying season were 58 adults were found.

Rare Nesting Birds: Least Terns, Common Terns, Black Skimmers, Piping Plovers, and Wilson's Plovers nest on sandy beaches found along the coast of the Mid-Atlantic States, including the beach at Grandview Nature Preserve. These birds nest generally in the area between the high tide water line and the foredune. They also frequently nest on open sandy areas known as blowouts or overwash fans on the beach and dune zone. These areas support little if any vegetation. The flat stretches are sandy and often strewn with rocks, shells, driftwood, and much too frequently, trash. Areas closer to the foredune may have some tufts of beach grasses.

Least Terns, Common Terns, Black Skimmers, and occasionally Wilson's Plovers, nest in colonies that may range in size from a few to several hundred pairs. A colony will sometimes consist of several different species of colonial shorebirds. Piping Plovers are solitary nesters, but may locate near a colony of terns.

The nesting period begins in late April and runs through late August. This is the critical time for management at Grandview Nature Preserve. Through a grant from the Virginia Coastal Resources Management Program, beach stewards, biologists, and park rangers now have more involvement in the monitoring of this critical area. The nests of these birds are little more than shallow depressions in the sand. Some species, such as the Common Tern, will line the nest with grass, shells, and seaweed. Piping Plovers will

camouflage the vicinity of their nest with bits of shell or driftwood. The eggs of all of these birds are off-white and marked with dark brown or black speckles making them difficult to see against their sandy background. Each of these bird species demonstrates varying degrees of site tenacity. Site tenacity refers to how often they return to the same site to nest year after year. Preference for a site is reinforced by the relative success the bird experiences in rearing young at a given site. Flooding, predation, or other disturbances during the nesting period weaken site tenacity. This is especially true at Grandview. Of particular concern is the disturbance by humans who frequent the area. Some have been known to even build pyramids with tern eggs. The fact that Piping Plovers have not nested at the site for the past two years may be attributed to this disturbance. The beach stewardship program may help to reverse this trend through education. Piping Plovers show particularly strong site tenacity, which may contribute to their population decline as habitat is lost and human recreational activities intensify on more and more beach areas.

The best protection for beach nesting birds is awareness, understanding, and self-restraint on the part of beach users. Grandview Nature Preserve has signs posted to warn beach users. These areas are to be avoided from May through September. Factory Point has posted signs of areas to be avoided from April through September. Nest eggs are so inconspicuous that they can go unnoticed until it is too late. Dogs and other pets should be kept out of the area. Children should be educated and under the control of parents so as to not collect eggs. In addition, natural predators such as fox, raccoons, and gulls often prey on eggs and young birds. Although predation is a natural event which nesting birds have always had to contend with, predator populations may grow with increasing human activity on beaches. Beach users can help reduce such impacts by removing all food scraps and garbage from the beach. (Information on rare nesting birds obtained from: *Natural Resources Fact Sheet, Rare Beach-Nesting Birds of Virginia*), Virginia Department of Conservation and Recreation.

Grandview Beach was a nesting ground for Loggerhead Sea Turtles (*Caretta caretta*) but more research will need to be done. This turtle is the most abundant sea turtle in Virginia Coastal waters and currently designed as threatened by the United States Fish and Wildlife Service and by the state. Female sea turtles return to the beach where they were hatched. A critical time for management is during the breeding season which is April thru August. The turtle drags herself onto the beach at night, digs a hole and lays

up to 119 eggs. She then covers the eggs and returns to the Chesapeake Bay with having no parental care. The biggest predators to the eggs are raccoons and foxes. If nests are found on the beach nesting season boxes will be constructed and placed over the nest to protect eggs. This process will be closely monitored by the wildlife biologist.

A delicate and unique city area, in terms of wildlife and plant diversity, is Sandy Bottom Nature Park. The park is 456 acres of mixed hardwood-pine forest dotted with non-tidal wetlands, an ephemeral pond and two lakes. These conditions coupled with sound management make good conditions to preserve some of the city's more sensitive wildlife. Species of particular concern are the Canebrake rattlesnake (*Crotalus horridus*) and the Mabee's salamander (*Ambystoma mabeei*).

Canebrake Rattlesnake: The Canebrake rattlesnake is currently listed as state endangered (S1) in Virginia by the Department of Conservation and Recreation, Division of Natural Heritage. It is believed that fewer than five viable populations remain in the state. The Peninsula populations are at the northern limit of the range of the Canebrake along the Coastal Plains.

The Canebrake rattlesnake is a large venomous snake that inhabits hardwood to mixed hardwood-pine forests, canefields, and ridges and glades of swampy areas (Terwilliger 1991). These snakes prefer mature hardwood forests with numerous logs or downed wood and a thick layer of leaf litter or humus. They reach a maximum length of just over five feet in Virginia. The body color is pinkish, gray, yellow, or light brown with a series of dark brown to black chevrons. A brown or chestnut mid-dorsal stripe is present on most individuals. The underside is a cream color and may be lightly speckled with black. The tail is black in adults (Terwilliger 1991). These characteristics camouflage it well in its natural environment. It is extremely difficult to see when coiled on a forest floor covered with leaf litter.

Populations such as the Canebrake near the edge of their range are commonly more at risk of extinction than those in the center of their range (Meffe & Carroll 1997). However, the primary threat to Canebrakes in Virginia is loss of habitat due to urban development. Two consequences arise from this form of habitat loss. The first is exposure to misinformed people who kill snakes they encounter and exposure to vehicles on roads within their migration routes. The resulting deaths can quickly eliminate the reproductive adults from the population. The second consequence is

fragmentation of their habitat, resulting in smaller, isolated populations that are not viable in the long term. Population inviability results from inadequate prey resources, inability to find mates, inadequate winter hibernacula, and, eventually, inbreeding depression within these small, isolated patches of habitat. There is concern that these snakes may be extirpated in just a few years (Terwilliger 1991). It should be pointed out that the presence of adult snakes in an area does not constitute the presence of a viable population, as individual adults can live a long time. The adults may continue to survive without producing enough young to continue the population. The mortality rate of the young is quite high, so many young must be produced. Female rattlesnakes can give birth no more frequently than every 2-3 years locally. Although the young are venomous, many animals such as opossums, raccoons and raptors successfully prey upon them. Some predators, such as opossums and kingsnakes, are even immune to rattlesnake venom. Although this snake is typically docile, avoidance of contact is highly recommended due to its current status and its potentially venomous bite.

Mabee's Salamander: This salamander is currently listed as state threatened (S1/S2) in Virginia by the Department of Conservation and Recreation, Division of Natural Heritage. It is believed that 5-20 viable populations exist in Virginia. It is common on the Coastal Plains of the Carolinas, but rare in Virginia. Hampton is near the northernmost limit of its distribution.

The Mabee's salamander is a small, stout member of the mole salamander family (the Ambystomatids). They reach a maximum length of 122.1mm. Their color is dark brown to grayish brown above and paler below. Whitish flecks appear laterally and may be so abundant as to form a mottled pattern (Terwilliger 1991). They inhabit fish-free ephemeral ponds and surrounding areas. The surrounding forests are generally composed of bottomland hardwoods mixed with pine. During mating season, adults migrate toward the ponds in fall and winter. The larval period is spent in the pond until metamorphosis occurs in April or May. The juveniles then leave for terrestrial life returning only to breed (Terwilliger 1991).

While the Hampton populations are near the northernmost limit of the species' range, the primary threat to this species is loss of habitat. As is true of all long-lived species, the presence of adults is not necessarily evidence of a viable population. Adequate reproduction and survival of the young must occur for the population to be viable. Successful reproduction does not

occur in dry years when ephemeral ponds do not fill on time in the fall, or the water dries up too soon in the spring. Avoidance of this species is recommended because the animals are rather delicate and because of its current status.

See Appendix I for a list of wildlife indigenous to The City of Hampton.

Human/Wildlife Interaction – Injury and Death

Another area of concern in addressing human/wildlife interactions is that of accidental and unnecessary injury and/or death of wildlife. Areas to be researched on this issue are:

- Development of a “hot spot” map for the city, i.e. a map indicating where wildlife is more prevalent and may be likely to enter the path of oncoming vehicles. These areas could be posted as animal crossings to warn motorists to slow down. This reduces the possibility of collisions with animals, which is a threat to human safety as well as to wildlife.
- Support a network of properly trained rehabilitators at Wildlife Response, Inc (WRI) of Southeastern Virginia. The success of the organization has initiated the development of a statewide network association. This organization works toward the same goals as are being established by this management plan. WRI will be instrumental in providing information and education on many of the issues that are being addressed.
- The possibility of Hampton Animal Control (HAC) or other law enforcement agencies adopting a euthanasia policy will be investigated. This will require outside trainers to be brought in to initiate the program. The People for the Ethical Treatment of Animals (PETA) has expressed interest in working with the police department in making the contacts to develop the training program.
- When wildlife is found dead, there is concern as to the timely removal of such before it presents a health concern. The HAC is responsible for the removal of dead wildlife from roads, parking lots, beaches, etc. In order to keep records on kills, a database may be developed on certain species and areas in which they are found dead. This would require training of the individuals who are retrieving the carcasses. While roadkills are

painful to contemplate, they provide vital wildlife information. A database of roadkills is a simple but important tool for monitoring wildlife. The presence of some species in an area is most easily detected as roadkills. The decrease or absence of roadkills of some species can also be an indication of disappearing populations.

- Since roads constitute either a major risk of mortality or a barrier to movement for wildlife, the use of passageways under future roads or roads undergoing improvement should be used when feasible. Designs for wildlife passageways are currently under investigation as are simple methods for guiding wildlife to these passageways. These designs are being developed with economic as well as wildlife factors in mind. Measures as simple as larger than usual culverts for streams under roads are often as much as is needed. The wildlife management team will research these methods and establish a database of such designs.

Human/Wildlife Interaction – Feeding of Wildlife

Establishment of a city-wide policy on feeding of wildlife is currently being researched. In many cases people create their own problems by feeding the “cute” squirrel or deer that may happen to wander through their backyard. This encourages a behavior for the animal that becomes repetitive. In a short period of time, the animal’s “friends” catch on. Then the homeowner has a problem. Homeowners have to realize that when they begin to feed wildlife they are taking on a long-term responsibility. A prime example is bird feeders. If homeowners plan on using bird feeders they should only put used during the winter months. Using them in the spring teaches fledglings to use the feeders and not learn the proper way to find their own food. This would create a problem during migration.

Education on feeding is needed in urban areas. An example of the public being uninformed is that of feeding ducks and other birds and wildlife with bread. Wildlife often are nutrient-limited and cannot afford to eat “junk food” the way people do. It is detrimental due to the fact that they fill up on it to satisfy hunger. Therefore, feeding bread to wildlife is detrimental because it satisfies hunger while providing no nutritive value.

Unfortunately, feeding the ducks with leftover bread is a favorite pastime of many people. Most people are unaware of the harm that they are doing and are willing to cease the behavior once they are educated. Development of a demonstration-feeding program will be researched.

Public Education

An education and information program is currently being offered though out the year. This program is designed to be of benefit to the general public, as well as city employees who deal directly with the issues in this document. Reference materials will be made available in libraries, parks and other public facilities. The nature center at Sandy Bottom Nature Park offers a library that focuses primarily on flora, fauna and related environmental topics and issues. Programs on these topics are offered to the general public. These programs will be expanded to include education on topics associated with problems and issues of wildlife management in the city and will be tailored to Hampton ecosystems.

Issues which will be addressed in the educational program will include, but will not be limited to:

- What to do if injured, diseased or orphaned wildlife are encountered.
- Whom to call to pick up dead wildlife.
- What to do about nuisance wildlife.
- How to create a backyard habitat for wildlife.
- Where to go to safely observe wildlife.
- Why wildlife shouldn't be kept as pets.
- When and how wildlife should be fed, if at all.

Homeowners need to be aware of and deal with certain questions. They are encouraged to make their homes attractive places for wildlife, but before taking steps toward this end, they need to carefully consider the consequences and their personal priorities. Is it more important that birds take up residence in your backyard or that your pets have unrestricted access there? Is your interest and desire in growing exotic and delicate plants that also attract deer and rabbits important to you? Can you cut down on the size of your lawn and plant native species as wildlife food sources, or must you have that expansive, high maintenance grassy area? Is your yard safe for wildlife, or do you store toxic substances that may harm wildlife? Do you have accumulating woodpiles or debris that animals may take up residence in at the risk of being forced out when the rubbish is removed? (Landau and Stump 1994). If the homeowner does decide on a backyard habitat, it is important that they include the basic elements of food source, water, cover and nesting areas. An example of a suitable design is shown in figure 2.

This information will also be made available on the internet through a wildlife hotline website. Information Services will assist in creating the site.

In addition to offering programs and general information, the feasibility of offering technical assistance will be researched. This will require the establishment of a technical advisory team. Assistance will be accomplished through hands-on assistance, as well as establishment of demonstration areas of native plants and other wildlife practices suitable for landowners. Sandy Bottom Nature Park is a pilot site for this program with an established backyard habitat demonstration area. The demonstration area will show how to effectively accomplish this without using lethal alternatives. Means of insect and weed control without the use of harmful chemicals will also be demonstrated. These chemicals often destroy the beneficial organisms, along with the bad.

Education of Professionals

A program will be initiated to educate public servants on wildlife management issues. When critical issues in this plan are researched and addressed, educational sessions will be catered to personnel in appropriate departments. These sessions will be designed as retreats at Sandy Bottom Nature Park in order to motivate employees to attend.



Habitat Control

Habitat control may be enhanced or initiated in a number of areas within the city. One example of this measure would be at Sandy Bottom Nature Park. Some areas of the park are targeted as prime locations for mechanical control. These include mowing, discing, and planting. Of particular concern are open areas that can easily be enhanced as grazing meadows. This is not

only desirable in creating wildlife watching areas, but provides valuable grazing areas for deer. This provides a feasible alternative to feeding on residential and commercial ornamentals.

Mowing is useful in preventing the spread of exotics such as kudzu, when growing along the ground, and other exotic herbaceous plants such as purple loosestrife. Mowing of *Phragmites* may offer control of the plant by keeping it short enough for other plants to colonize the area. Mowing will keep areas in an early successional stage, which provides edge habitat. This provides a source of food for animals ranging from neotropical migrants to deer. Recommendations on planting in these areas will be obtained from Virginia Department of Game and Inland Fisheries.

Along with mowing, discing will be considered in an attempt to control the spread of and/or eradicate *Phragmites* and other exotics. Discing will be necessary to create fire lines if any controlled burning is considered. It is also feasible to disc areas that are being considered for replanting with native grasses.

Cooperative Control Efforts

The Virginia Department of Forestry recommends controlled burns as a practice to restore habitat to early successional stages, release nutrients and remove unwanted woody vegetation. Burned areas would be planted with small trees that are good mast producers, as lack of available forage may be one of the factors that cause deer to forage in people's yards. As Hampton is in attainment for air quality, a controlled burn program may be an option. Education of homeowners that could be impacted by smoke would be required. Burns are extremely beneficial to wildlife habitat and are common practice in southeast forests. With the proper weather conditions, it is possible to burn without sending smoke over any residential area, especially if the mixing height is good. Only small acreage burns will be considered with proper firebreaks and assistance from the Hampton Fire Department. Areas will be targeted for restoration with native grasses and where possible, trees and shrubs will be planted. This is a program that has been adopted by the Department of the Army at Ft. Monroe. Many grants are available for this type of project. Partnerships are desirable outcomes of this endeavor. Funding and assistance will be pursued through the Hampton Clean City Commission (HCCC). The Virginia Department of Forestry will be contacted for recommendations and possible assistance. Sandy Bottom Nature Park and the HCCC have been very successful in working with

volunteer groups, such as the local scouting organizations, in planting projects.

Recommended plantings will be with as many hard and soft mast producers as possible, using only species that are native to Virginia. This increases the overall food sources and the increased diversity would help ensure that some mast is produced under varying or adverse seasonal conditions. Deer need additional food sources. It is preferable to improve the natural food sources rather than implement an extensive food plot program. This would encourage deer to forage more in the undeveloped areas.

Fort Monroe is planting riparian areas with native trees and shrubs to enhance wildlife habitat for birds, reptiles and small mammals as a part of the Department of Defense's Chesapeake Bay Initiative. Similarly, at Big Bethel Reservoir, a management plan is being implemented to manage the undeveloped riparian areas and associated lands. These areas are being planted with mast producing trees and shrubs. This will provide additional food and shelter for wildlife inhabiting the area. Their efforts in improving habitat and available food sources will assist in drawing deer to this area, thereby reducing impact to surrounding neighborhoods due to better foraging. The military's efforts will compliment the city's wildlife management efforts. The Department of the Army's model and recommendations will be an integral part of this plan. They have offered the use of dibble bars and other tree planting equipment for our projects.

Homeowners who have open areas should be encouraged to plant wisely. This will be addressed as public education in the next section. The city will investigate areas that can be planted as alternate food sources for deer.

Other areas to be researched will be chemical and biological control. This will be in an effort to determine the effects of controls such as herbicides and insect predators. Controlling habitat is important in keeping check on many species that may become too abundant. This is a critical factor in preventing malnutrition and the introduction of diseases.

Due to the expense involved with herbicides, it is recommended that they be used only in critical areas or to eradicate exotics before they become established. To avoid negative impacts, herbicides should be used sparingly or not at all near wetlands. It is possible to use herbicides along with combinations of mowing, disking and burning when attempting to eradicate

Phragmites and other invasive alien plant species such as Japanese Honeysuckle.



Conservation of Wildlife Habitats

It will be one of the goals of the wildlife management plan to maintain, conserve and develop wildlife habitats. This will be accomplished through a systematic investigation and cataloguing of existing wildlife and habitats in the city. Much of this process will be aided by tapping into existing databases. Information will be gathered from the Virginia Department of Game and Inland Fisheries (VDGIF), the United States Fish and Wildlife Service (USFWS), Fort Monroe, and other applicable agencies that have compiled statistics for wildlife research. Some of this information will be, at best, applicable to only past problem areas that were addressed as they were funded. Although this information will be useful to the city, it will need to be researched for possible updates in the status of certain species. For example, the Mabey's salamander (*Ambystoma mabeei*) was listed as "protected" in the 1991 publication of *Virginia's Endangered Species*. In the 1995 publication, *A Guide to Endangered and Threatened Species in Virginia*, the salamander was listed as "endangered". However, the current status is considered to be "threatened". VDGIF has a centralized database containing information regarding plant and animal survey/distribution records in Virginia and some species-specific life history information. The database is called the "The Virginia Fish and Wildlife Information Service." It can be accessed via inter-net with an account that has been established with VDGIF.

Natural Area Protection

Private property owners can donate or sell their open spaces to either a charitable conservation organization or government agency for a variety of conservation purposes including for the intrinsic value of set-aside open

space. Another option is for a property owner to donate a conservation easement. This is a voluntary restriction on the use of land negotiated by a landowner with either a charitable organization or government agency chosen by the landowner to hold the easement. The property owner retains ownership, including the right to use or sell the land within the limitations of the easement.

Statewide charitable organizations that accept donations of land or easements include the Virginia Outdoors Foundation (VOF). The VOF was established by the Virginia General Assembly to preserve areas of the Commonwealth having natural, scenic, historic, scientific, open-space, or recreational characteristics. The VOF currently holds easements on 667,443 acres in the Commonwealth of Virginia.

Local charitable organizations that accept donations of land or easements are called land trusts. Land trusts are non-profit, voluntary organizations that acquire land or easements through either purchase or donation. Land trusts protect open space of all kinds, including wetlands, wildlife habitat, shorelines, forests, scenic view, watershed, and land of every size and type that has conservation, historic, scenic, or other value as open space.

Natural Area Dedication is a conservation option available to landowners of highly significant natural areas. Dedication is the placement of natural areas, both privately and publicly owned, into Virginia's Natural Area Preserve System. The landowner retains ownership and transfer rights of the land, while voluntarily restricting those land uses that are not compatible with the conservation needs of the natural area.

This option will be explored for both Grandview Nature Preserve and Sandy Bottom Nature Park because of animal species of concern at both facilities. Only the most significant natural areas in Virginia are considered for Natural Area Dedication. To be eligible, a property must include one or more of these natural values:

- Habitat for rare, threatened, or endangered plant or animal species
- Rare or state significant natural communities
- Rare or state significant geologic sites.

A landowner who is interested in dedicating land will contact the Virginia Department of Conservation and Recreation (DCR). If the property qualifies

for Natural Area Dedication, the landowner and DCR will write a legal document known as the Instrument of Dedication. This will address factors such as legal description of the area, the conservation objectives, the extent of public use desired, and the land uses that will be restricted. The document will be recorded with the deed of the property, ensuring permanent protection of the natural area against conversion to inappropriate uses.

Once natural areas are placed into Virginia's Natural Area Preserve System, DCR stewardship staff assists landowners in developing management plans and conducting management activities. A variety of management techniques are used to preserve native ecological systems, rare or vanishing flora and fauna, and significant geological features. Management may involve repairing trails, posting boundaries, studying hydrology, controlling invasive species, conducting prescribed burns and restoring damaged natural communities.

(Information on Natural Area Dedication obtained from: *Natural Area Protection, Natural Area Dedication* fact sheet, Virginia Department of Conservation and Recreation.)

Field Studies of Habitats

This process will involve numerous studies of the open areas and green spaces in the city, including transect studies, live trapping and visual observations. Populated areas will receive special attention as need arises. These areas will be addressed later in this plan. The resulting statistics will be compiled as an addendum to this plan. The documentation will be reviewed and updated as needed. This is recommended to be done at least every two years. Wildlife biologist from the city will be assigned to monitor the plan to ensure that a current status is maintained.

Steps, which are applicable in the study, will be:

1. Identify habitats and determine their value for wildlife.
 2. Identify habitats of threatened and endangered species.
 3. Identify groups of plant species of value to wildlife.
 4. Analyze adjacent land uses.
 5. Identify species that would be present if proper habitat were provided.
- (Grey and Deneke 1992)

As data is collected and assimilated, VDGIF will be consulted for recommendations. These recommendations will be sought particularly in the event of the discovery of a threatened or endangered species, wildlife diseases, or nuisance wildlife situations.

Public Health Concerns

Public health concerns relating to wildlife will be addressed. The primary area of concern is that of wildlife diseases. Most notable is the confirmed presence of rabies in the city. This disease is transmitted through human interaction with wildlife's saliva. An increased awareness of the problem has been stimulated due to its presence here. The city will work with the Hampton Health Department in providing educational information in public areas such as parks and libraries. This information will advise the public on the avoidance of wildlife contact, the signs of rabies, steps to take if you are exposed, etc. The raccoon, along with the fox, skunk, and bat are considered to be the primary carriers of rabies in the country and are known as rabies vector species. (See Appendix J)

Diseases

Arthropod-transmitted such as Lyme disease and Rocky Mountain Spotted Fever remain threats to people of all ages. Again, educational information or programs will be made available in public parks and libraries. The city entomologist will be consulted on means of control of these pests.

Giardiasis is caused by the single-cell protozoan *Giardia lamblia*, which can be spread through contamination of water systems with the fecal matter of both aquatic and terrestrial mammals. Drinking untreated water is the most common method of transmission of the disease. People who swim in public waterways (freshwater) are particularly susceptible (HSUS 1997).

A final disease issue to be addressed is that of psittacosis, which is a disease carried by birds. The pigeon population within the city continues to increase. Unless steps are taken to control these birds, the threat of psittacosis will increase. Pigeons, because of their roosting and nesting habits, can pose problems through the accumulation of fecal materials in high traffic areas. The Health Department will be consulted on this issue.

According to the Hampton Health Department, the city is responding well to rat complaints. They receive few complaints regarding the rodents and have received none regarding the response from the city when the problem is on city property.

Due to the risk of exposure to disease, it is best to minimize the interaction between humans and wildlife. Certainly it is best to eliminate all physical contact between the two groups. The first step will be to educate the public in the dangers of interaction.

Minimization of Habitat Loss

The city, with considerable community input, is currently in the process of updating the Hampton Community Plan. This task is being accomplished with the assistance of an advisory committee appointed by the planning commission. As part of that process, several strategies related to this subject will be researched in an attempt to minimize further loss of existing wildlife habitat. The advisory committee and the community will carefully scrutinize these strategies before recommendations are included in the plan. The issue of “economic development vs. land conservation” is becoming more controversial as the land suitable for development is becoming more and scarcer in the city. However, as the city identifies areas for redevelopment there may be more opportunities for natural resource enhancement and restoration.

Areas and strategies to be researched in the development of the 2020 Hampton Community Plan include:

- Expanding the environmental information in the 2010 Hampton Community Plan to include a wildlife survey and other natural resources.
- Identifying wildlife corridors in the 2020 Hampton Community Plan for protection, enhancement, and/or restoration.
- Offering incentives to private landowners to not sell undeveloped tracts of land. Much of the undeveloped area in Hampton is under private ownership.
- Informing landowners of state and federal conservation programs and encouraging them to participate. These programs may designate qualifying lands as conservation easements, natural area preserves, land trusts and other partnerships.

- Entering city-owned land into these contractual agreements. The cooperating agency may provide a biologist to survey the wildlife and habitats. This can result in the development of a management strategy to be incorporated into the contract.
- Redeveloping existing commercial, industrial and residential land as a tool for protecting and enhancing existing habitat. This process will be aided by consultation with the city Planning and Zoning Departments.
- Zoning-friendly practices; i.e., cluster zoning and planned unit development, will be examined.
- Encouraging developers to incorporate environmentally friendly landscape designs into their plans as development or redevelopment occurs.
- Encouraging developers to provide a wildlife management plan or wildlife impact assessment along with their development plans. This would allow for the proper course of action in enhancing the existing habitat immediately surrounding the development area.
- Adopting a policy for mitigation compensation for replacement or enhancement of wildlife habitat. This would be applicable to new development that destroys areas of wildlife habitat.
- Maintaining habitat impact assessments and a detailed catalogue of assessments.
- Researching and making recommendations on transportation alternatives such as a light rail system.
- Researching and making recommendations on proposed new roadways or proposed modifications to existing roadways to make them more wildlife-friendly as lack of access to land is a form of habitat loss for wildlife.

Landowner Incentives

The Hampton Clean City Commission (HCCC) will play an integral part in the implementation of this plan. Their involvement will be aimed at the development of incentives to landowners to maintain, conserve and develop wildlife habitat such as public recognition to landowners for wildlife stewardship efforts. The National Wildlife Federation has a backyard habitat designation program. HCCC has a program called YARDS, Yards Are Really Distinctive Showplaces. YARDS is a monthly contest designed to promote community awareness of the importance of environmental friendly yards. This program has recognition by City Council, newspaper recognition, website recognition and special signs acknowledging

outstanding wildlife habitat designs.

The Commission's Keep Hampton Green Program is specifically focuses on purchasing trees for public areas; it can encourage native plants by private parties through its various programs. This program may be merged with the YARDS program in some manner. The HCCC utilizes a work force of volunteers, including scout groups, for plantings. This group will be involved in the development and enhancement of wildlife habitat.

The Business, Industries and Governmental Agencies Committee of the HCCC will be consulted in the area of promoting wildlife-friendly landscape designs for developers in business and industry. A sub-committee of concerned business owners and developers will be formed to address the issue. This segment of the industry will be identified and recruited through public advertising, including publicity through the daily press.

HCCC has adopt-a-spot program volunteers that help keep the city clean and beautiful. This program helps reduce wildlife that might get entangled in trash and use trash as nesting material. HCCC works with International Coastal Cleanup and Clean the Bay which helps clean Hampton's coast.



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